In the Claims:

1. (Original) A method of detecting combustion inefficiency in an engine having multiple cylinders, comprising:

detecting a peak in an oxygen level in an exhaust stream; and

linking the peak in the oxygen level to a particular cylinder in the engine.

2. (Original) The method of claim 1 wherein detecting a peak in an oxygen level comprises detecting a peak in an oxygen level with a lambda sensor.

3. (Original) The method of claim 2 wherein detecting a peak in an oxygen level with a lambda sensor comprises detecting a peak in an oxygen level with a lambda sensor positioned in an exhaust manifold.

4. (Original) The method of claim 2 wherein detecting a peak in an oxygen level with a lambda sensor comprises detecting a peak in an oxygen level with a lambda sensor positioned proximate a catalytic converter.

5. (Original) The method of claim 2 further comprising associating each of the multiple cylinders with a unique oxygen sensor.

6. (Original) The method of claim 5 wherein linking the peak in the oxygen level to a particular cylinder comprises discriminating between the unique oxygen sensors as to which oxygen sensor detected a peak in the oxygen level.

7. (Original) The method of claim 1 wherein detecting a peak in an oxygen level comprises directly detecting an oxygen level.

8. (Original) The method of claim 1 wherein detecting a peak in an oxygen level comprises inferentially detecting an oxygen level.

9. (Original) The method of claim 1 further comprising generating a timing reference associated with the engine.

10. (Original) The method of claim 9 further comprising linking the timing reference with the peak.

11. (Original) The method of claim 10 wherein linking the peak in the oxygen level to a particular cylinder in the engine comprises comparing the linked timing reference and peak to a fingerprint for the engine.

12. (Original) The method of claim 11 wherein the fingerprint is one of multiple fingerprints assembled in a database.

13. (Original) A computer readable medium having software stored thereon, said software adapted to detect combustion inefficiency in an engine having multiple cylinders by:

comparing a sensed oxygen level coupled with a timing reference to a database of fingerprints.

14. (Original) The computer readable medium of claim 13 wherein said software is adapted to receive inputs from probes connected to a lambda sensor and a timing reference generator.

15. (Original) The computer readable medium of claim 13 wherein said software is adapted to output an indication that the combustion inefficiency is linked to a particular cylinder of the engine.

16. (Original) The computer readable medium of claim 13 wherein said software is adapted to generate a timing reference for engines selected from the group consisting of those using a distributorless ignition system (DIS) and those using a distributor system through the calculation of an offset.

17. (Original) The computer readable medium of claim 13 wherein said software is adapted to receive the sensed oxygen level from a probe connected to a sensor that senses oxygen levels indirectly.

18. (Original) A vehicle adapted to detect combustion inefficiencies, comprising:

an engine comprising multiple cylinders, each cylinder having an exhaust port associated therewith;

a plurality of oxygen sensors, each of said plurality of oxygen sensors associated with a different one of the exhaust ports; and

an onboard computer adapted to receive inputs from said plurality of oxygen sensors and discriminate thereamongst, said onboard computer adapted to determine if a given cylinder has a combustion inefficiency based on peaks in oxygen sensed by said oxygen sensors.

19. (Original) The vehicle of claim 18 wherein said oxygen sensors detect oxygen levels inferentially.

20. (Original) The vehicle of claim 18 wherein said oxygen sensors detect oxygen levels directly.

21. (New) The method of claim 1 wherein linking the peak in the oxygen level to the particular cylinder in the engine comprises inferring that the particular cylinder had an incomplete combustion.

22. (New) The method of claim 1 wherein linking the peak in the oxygen level to the particular cylinder in the engine comprises determining which cylinder released exhaust gases containing the peak in the oxygen level.

23. (New) The method of claim 22 wherein determining which cylinder released the exhaust gases containing the peak in the oxygen level comprises inferentially determining which cylinder released the exhaust gases containing the peak in the oxygen level.

24. (New) The method of claim 22 further comprising using a known firing order of the cylinders to assist in determining which cylinder released the exhaust gases containing the peak in the oxygen level.

25. (New) The computer readable medium of claim 13 wherein the database of fingerprints comprises a database of fingerprints relating to empirically derived oxygen levels.

26. (New) The computer readable medium of claim 25 wherein the empirically derived oxygen levels are derived from introducing a known combustion inefficiency into a normally operating engine and wherein said fingerprints comprise data related to oxygen levels detected in an exhaust path associated with the normally operating engine.